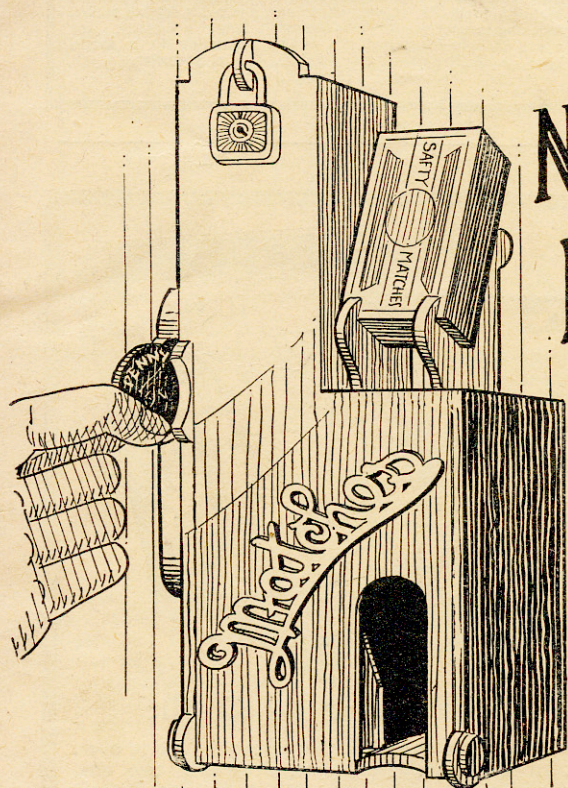


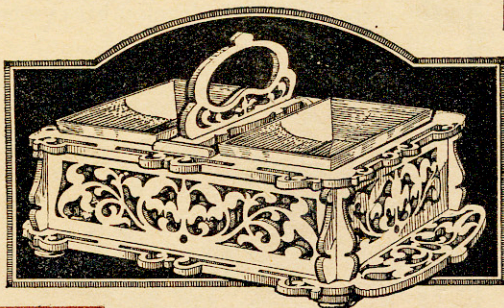
Hobbies

WEEKLY



NOVELTY MATCH BOX
DELIVERY CABINET

FRETWORK
FRUIT-DISH HOLDER



December 11th. 1937

2^D

Vol. 85. No. 2199

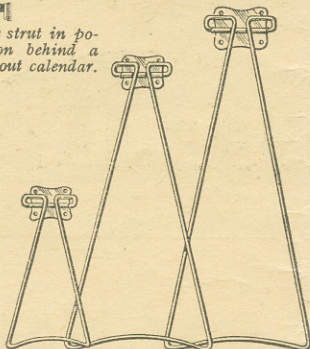
THE FRETWORKER'S AND
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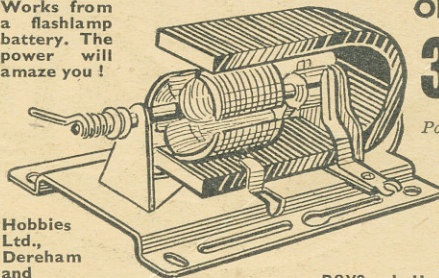
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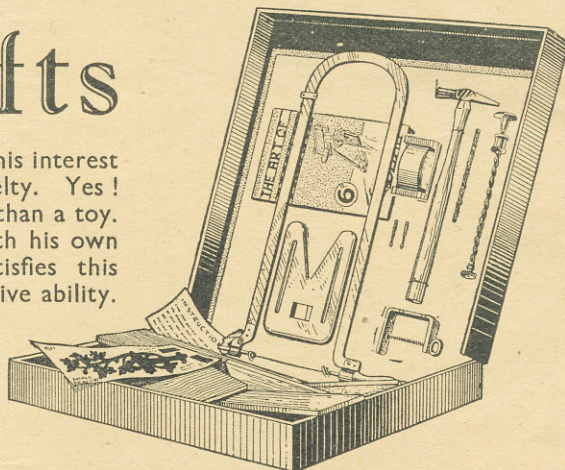
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This is really a double-purpose motor, because you can use it for driving models, or by fitting it into a boat hull and coupling to a Hobbies propeller, it will show an amazing turn of speed. The overall width is only 2ins. and the metal base is drilled for easy fixing. (Foreign.)

BOYS...! Here's just the motor you have been looking for. It has a powerful magnet, three-pole armature, "long-life" bearings, non-slip driving pulley, and a crank for coupling to a model boat propeller.

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What shall I give him? Toys do not hold his interesthe quickly tires of a clockwork novelty. Yes! —the modern boy wants something more than a toy. He wants to build.....to create things with his own hands. A Hobbies Fretwork Outfit satisfies this desire and helps him develop his constructive ability.

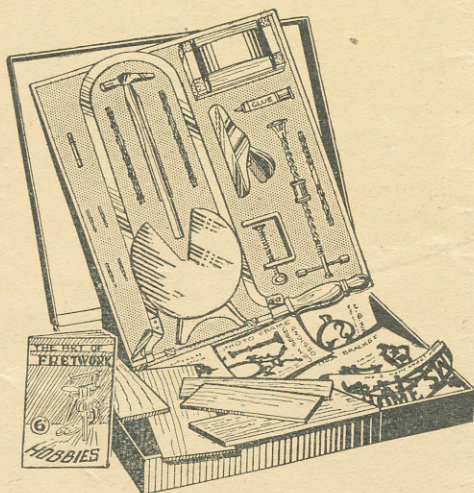


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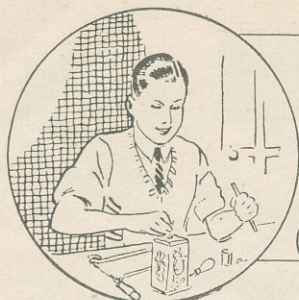
The Splendid A3 Outfit

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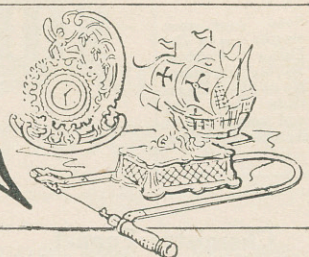
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Hobbies

WEEKLY



December 11th. 1937

Vol. 85. No. 2199

HERE'S another novelty this week which I know everyone with a fretwork set will want to make! A slot machine made in wood where you get a box of matches every time you insert a penny. A good way to make money too, because you get a packet of a dozen boxes for about 9d. or 10d. and then make people pay a penny a box in the machine. How about it? And another mechanical article is seen on page 281 where we have a Lucky Cat Money Box. When you stroke the cat's tail he opens his mouth in a smiling invitation to put a coin in the slot!

HOW quickly we seem to be getting to Christmas! Why only two weeks now, and it will be on top of us. Have you finished all those gifts you wanted to complete with the fretsaw? And have you cut-out all those quaint colour calendar pictures? I'll bet you haven't! And with only a few more real working days there is no time to be lost.

BY the way, there will be patterns next week for two new Christmas Cards you can cut out with the fretsaw. Each is of typical Christmas style and is just a postcard size. Cut out in thin wood or composition, and mounted on another piece they make very striking and decidedly novel gifts.

WITH the holidays coming we shall all have a little more time on our hands, and I hope that these odd hours will be spent profitably. It is such a pity to waste time just loafing about and wondering why the time is long. There are so many things to do, and see, and think about that the hours and days should not be long enough. The busy fellow is nearly always the happy one, so find yourself something during the hols. Of course, if you are terribly hard to please and cannot find enough in Hobbies Weekly, there are still a few hundred

opportunities provided in the Hobbies Handbook. Of which I am delighted to hear that more than ever before have been sold. Just shows you, doesn't it, that the joy of making things and being real craftsmen is appealing to more and more people.

OUR younger readers still at school, and who live in or around London, should visit the Schoolboys' Exhibition being held at the Imperial Institute, South Kensington, from the day after Boxing Day, to Jan. 8th. There are television, electrical novelties, aviation, sport, etc., all depicted and provided in an interesting manner. Of course, such an exhibition is also marvellously interesting to grown-ups, and I shall be there myself to keep *au fait* with the latest development in things in general. Needless to say George, the tame office boy, will expect a half-day off to try out the latest gadgets, to gather as many samples and lists as he can, and to poke his way to the front of the crowd round every stand!

WHAT lifelong friends of Hobbies Weekly we have, to be sure! Just listen to this. We had, in 1910—nearly 30 years ago a Society of Fretworkers something like our present Hobbies League and which was conducted from an address we then had in London. An application form for membership appeared periodically in Hobbies Weekly and the entrance fee was 6d. Well, would you believe it, I have just received one of

those entrance forms, with the money from Mount Edgecombe, Natal in South Africa! Fancy—over a quarter of a century ago since it was printed and now it turns up as large as life from over 5,000 miles away. I wonder what travels that copy of Hobbies has been on to get there and where it has been shedding its knowledge on the way!

Few other papers I know can have such a long "life."

The Editor

CONTENTS

DESIGN CHART—Fruit Stand

Hints and Tips	266
Twin Fruit Stand in Fretwork	267
Matchbox Delivery Cabinet	269
4-in-1 Wood Puzzle	271
Electric Cells from Odds and Ends	272
Soiled Linen Box	273
Tools and their Uses	274
Matchbox Delivery Cabinet Patterns	276
Novel Grip Tester	279
Mechanical Money Box	281
OO Gauge Coal Hoist	282
Books Worth Reading	284
Stamp Notes	287

Next Week's Design—Inlaid Mirror

Correspondence should be addressed to: The Editor, Hobbies Weekly, Dereham, Norfolk, and a stamp enclosed with the Reply Coupon from Cover iii if a reply is required. Particulars of Subscription rates, Publishing, Advertising, etc., are on cover iii.

Send your own simple tips to The Editor, Hobbies Weekly, Dereham, Norfolk. Keep them short and add rough pencil sketches if possible.

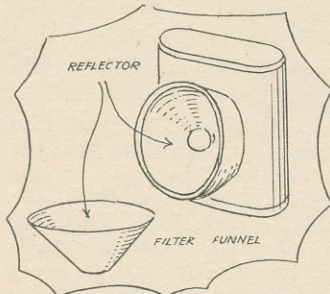
HINTS AND TIPS



For original Tips published the sender will receive a Hobbies Handy Propelling Pencil. We cannot acknowledge or print all tips sent in.

Chemistry Funnel

HERE is a simple tip which I have found very useful in chemistry. When you have a disused bicycle lamp do not throw it away. Unscrew the front and



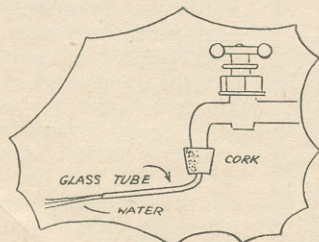
remove glass and bulb. You will find a loose, silver reflector, remove this and you will have a very useful filter funnel, as shown in the drawing herewith.—(D. M. Godfrey).

Doll's House Garden Paths

IF you have made a doll's house and want to make the paths here is a good tip. First get a piece of sack-cloth and cut it to any width or length required. Smear it with glue, then sprinkle some sand or sawdust all over. Sand is preferred, but either give a very realistic effect.—(J. Baker).

Cleaning Glass Tubes

IT is often difficult to clean the inside of glass tubes, but here, is a way to clean it effectively and easily. Insert the end of a tube in the hole of a cork and



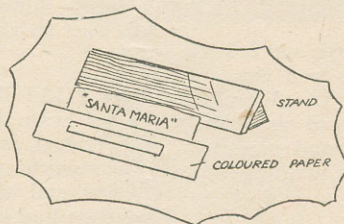
place the cork hard against a water tap as in the accompanying figure. Turn on the tap gradually when the water will rush through the tube and clean it quickly.—(S. Wallace).

Keeping Paint Brushes

EXPENSIVE paint brushes can be made to last much longer if, after use, they are cleaned in turpentine and then rinsed first in soda water and then in clear water. They can be reshaped with the fingers and if they are going to be put away, moisten the bristles with linseed oil. This will keep them soft and pliable.—(C. Fendley).

Label for Models

A NEAT finish to fretwork models is a "label" and here is a simple way of making one. From a piece of fancy paper cut a slot in the centre slightly larger than the name required



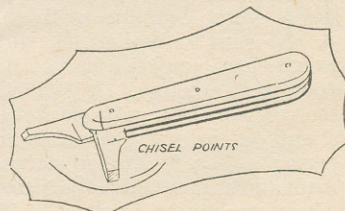
and glue it on the paper bearing the name of the model which is printed in Hobbies so that only what you wish to indicate is shown. Glued to a thin strip of plywood with the necessary stand at the back, you have the finish to the job.—(E. Mogan).

Hole Filler

HOLES in the wall made by nails or where the plaster has been removed, can be filled without expense. Tear up an old newspaper into small pieces and put into a bowl containing a few scraps of soap and boiling water. After soaking for a few minutes squeeze out and mix the pulp with a little cold potato until it has become like glue. Fill the holes with the mixture and when dried, paint over with a little whitening and soap mixed together.—(G. John).

Pocketknife Chisels

POCKET knives with broken blades can be converted into excellent little chisels for delicate work, in repairs or model making.



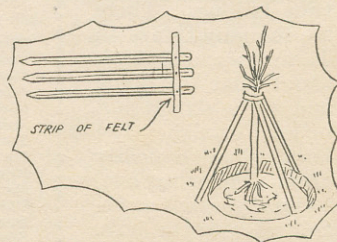
All that is necessary is to grind the broken blade or blades to shape, care being taken not to overheat the steel and ruin temper. Chisels $\frac{1}{8}$ in. and $\frac{3}{16}$ in. can be made. The regular handle is used for the chisel's grip.—(W. T. Mainwaring).

Calendar Hint

A GOOD tip for those fixing Hobbies Calendars by a $\frac{1}{8}$ in. strip glued behind, is to fix a rectangle of wood to the other side of the strip. It can then be used as a letter rack as well as a calendar as the two uprights have a suitable space between them.—(H. N. Soames).

Tree Planting Support

WHEN planting trees you need both hands free to attend to the roots. This temporary support will keep the tree in position while you spread out the roots and carefully cover them with soil. Nail a strip of felt or



leather to the tops of the poles, and attach a short length of string to each end. When the poles are tied together they make a tripod which can be adjusted to almost any height around the stem of a tree.—(R. Giddings).

The FRETWORKER

TWIN FRUIT DISH STAND

THIS week we have another design for making a practical piece of fretwork which can be used in any home, and which at the same time is attractive to look at. It is a little stand measuring just 12 ins. long and 6½ ins. wide, containing two glazed earthenware dishes which are suitable for holding sweets, with a place on the sideboard or side table.

The dishes have been specially made for Hobbies, are in bright cream glazed ware, with a gold rim round the top. They are made to fit into a stand, and the whole thing can be lifted about by means of a shapely handle across the top. The frets round the side are backed up with handsome green material which is supplied with the rest of the fittings, so the whole thing is quite a striking piece of work.

The Patterns

Moreover, as each of the parts is only small, the work can be undertaken by the beginner with the certainty of making a good job of it.

The patterns as usual are shown full size on the sheet, and can be pasted down right away to the various boards in the parcel supplied. In this particular job the parts are held together by two forms of joint—the halving joint and mortise and tenon joint. The halving is used to lock the ends and side uprights together, whilst the other joints made to hold the framework between the top and bottom.

Joints

The handle also is fitted in by a mortise and tenon joint, so the complete article if properly fitted will be perfectly rigid and strong. It is sometimes the difficulty of the beginner not to be able to get a long edge perfectly straight, and when such an edge has to be used as a butt joint, it does not always bed down as well as it should. This use of the mortise and tenon joint overcomes that difficulty because the tenon fits into the mortise tightly, and is then firmly glued and screwed in position.

These joints naturally must be carefully undertaken. One essential is to have an upright fret-saw during all cutting operations, otherwise the slot portion—or mortise—will bewider open on one

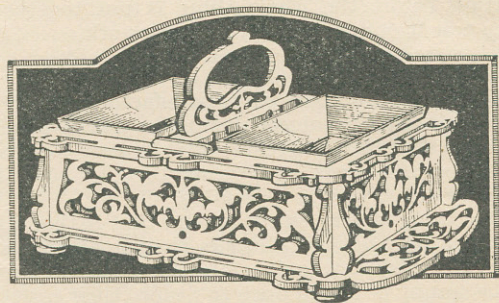
surface than it will on the other, and in consequence when the tenon comes to be fitted, it will either be too tight or too loose. Another point is that the parts forming the joint must be tested with each other before actually being cut. The tenon can be taken out first, then the part laid in position on the other piece of wood to ensure that the length and width are accurate. You cannot cut a tenon too small then fill up the mortise.

Care in Cleaning

The cleaning up will also affect the joint if you are not careful in this way. If you test out the joint, and get the two parts to make a good combination, then do not clean up the parts any more.

Occasionally we hear of a fretworker fitting the two pieces together with the remains of the paper pattern still on the wood. Thus a good joint is secured, but when the paper remains are glass-papered off the tenon, naturally the thickness of the wood is reduced slightly and the joint has become loose in consequence.

Remember, too, in glasspapering, to get the paper perfectly flat on the wood. If not, you will find that the end of the tenon tapers slightly and is thinner than the body portion. In consequence



Full size patterns on Design 2199

again, you have the likelihood that the joint will wobble.

So far as the halving joints are concerned, the two parts should slide together comparatively easily. The thickness of the slot should be exactly the same as the thickness of the wood, so the two pieces slide in easily. Do not attempt to force them home or hammer them at all, or you will break the piece across the narrow neck of wood. If, however, there is any gaping after the two parts are put together, run a fine nail through the end of the slot and so pull the parts together.

All these joints are glued in the usual way. Apply the adhesive quite thinly and if any is

MATERIAL REQUIRED

Fretwood.—For making this Stand we supply a parcel of Whitewood, with four (No. 20) Toes, 2/3, post free 2/9.

Fittings.—Two dishes in cream with gold rim (No. 6030), 9d. each. Sufficient green linen cloth for lining is also supplied for 4d.

A complete parcel wood, toes, dishes and cloth for 4/-, post free 4/6.

squeezed out through the joint when the other portion comes to be put in place, wipe it away immediately before it sets.

In addition to the glue, screws are always advisable to give additional strength, but they should be put in where they will not be seen afterwards. For instance, you could drive screws upwards through the floor into the sides, but it is not advisable to drive them downwards through the top. The handle can also be screwed on from underneath.

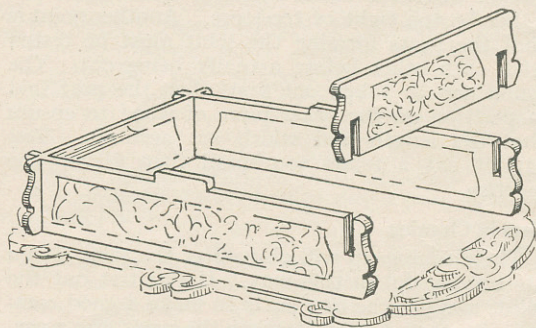


Fig. 1—A constructional view of the box showing the halving joint at the end

The detail herewith shows the construction of the box itself, then the top with the handle.

The main box, as has been mentioned, is built with the floor and the four uprights. These uprights are the two long sides and the two short ends all being halved together at the appropriate joint. Not only are they halved together, but the tenons are provided in the two long sides to fit into the floor. Be careful to get the position as well as the size of these correct, and test out each portion before the whole thing is put together then test it out as a complete framework.

Test the Joints

When you get two parts satisfactorily halved into each other or joined, then make a little pencil mark on the inside where it cannot be seen—so that these two pieces will be returned together again if they are taken apart for cleaning.

One thing is very essential, and that is that the distance between the joints is the same in every case. If this is not maintained the parts will have to be sprung or forced open to fit into their correct joints, and this in turn will weaken or even damage the pieces concerned.

Fitting together

Having got out and cleaned up the four sides, therefore, they can be fitted finally together, then placed on to the floor by the joints at E and F. If you wish, add the screws from beneath and also fit in little blocking pieces inside for further strength.

The top and handle will be added after these two pieces have been made and put together. But remember before adding them that you must put in the backing to the fretted sides of the box itself.

The material supplied in the sheet provides sufficient for the four pieces, and it is glued behind the sides with a dab of glue in a number of places. Get the linen cloth backing to lie quite close to the sides themselves, so it does not gape at any point.

The Top

Turning our attention to the top, we can get this portion out with its two rectangular openings for the dishes. Have the dishes in hand so you can drop them in place to ensure they fit nicely. They are provided with a flange round the top edge, which prevents them falling right through.

Notice, too, that the handle rests upon a base and that this base in turn rests upon the top itself. The base portion fits exactly between the two projecting tenons of the side which pass through at G and H. This base portion also has a long mortise which receives the projecting tenon (I) of the handle itself. Thus the handle is fixed to the base and that portion glued and jointed into the top centrally between the two dish openings. The position, of course, actually is fixed by the mortise in the top itself, and these portions should be tested out.

Feet from Waste

The pattern of the top includes four little circular pieces forming the feet, and these can be cut from the waste wood of the rectangle where they are shown. Cut the circles cleanly, then glue on the underside of the floor about $\frac{3}{16}$ in. inwards from the similarly shaped edge at that point.

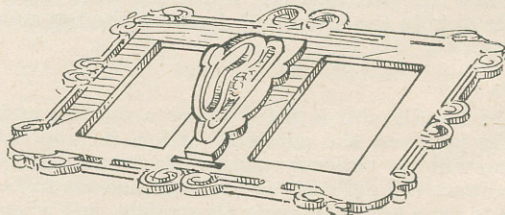
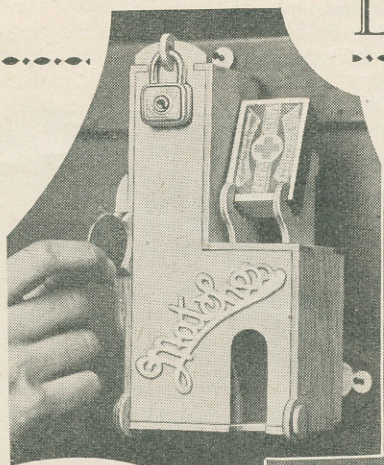


Fig. 2—The top framework and handle

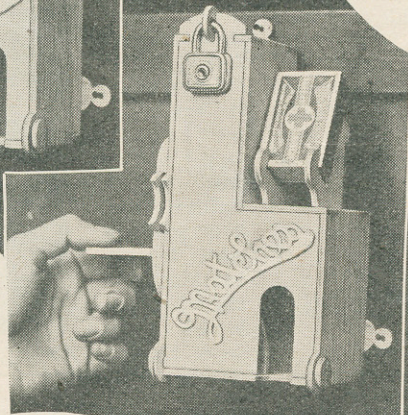
Below these little feet are glued the shaped toes (No. 20) which are supplied in the parcel of material. These toes have a very smooth flat surface on one side, and this must be roughed up with a knife or chisel so the glue gets a good grip to it. Turn the whole thing over, then put the toes in place, weighting them down until the glue is set, or of course, if you prefer, you can glue the little shaped toe to the flat round foot then glue both these pieces together on the underside of the floor, as previously directed.

**Special Fretwork Christmas Card
Patterns with next week's issue**

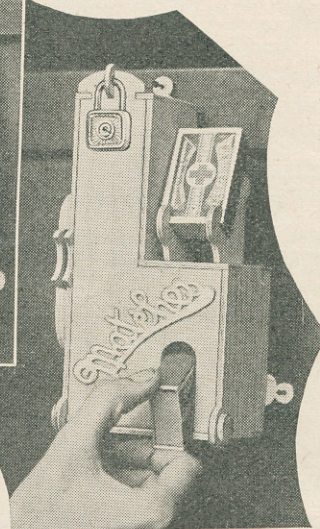
1d.-in-The Slot MATCHBOX DELIVERY CABINET



*Put a Penny in
the slot*



*Draw out
the slide*



*And there
is your
box of
matches!*

READERS with a mechanical turn of mind will delight in making the novel automatic slot machine illustrated in the photographs. It works just like the real thing and is certainly a big improvement over the plain matchbox holder.

It holds half a dozen boxes, particularly the wooden safety match type. As these usually cost 6d. per dozen, there is thus a profit of 2d. each time.

To work the machine, you simply insert a penny, pull out the slide at the left-hand side, then push it in again. A box of matches drops to the aperture, while the coin falls into a compartment of its own.

A Locking Device

Now, apart from all this, there is a special locking device at the coin slot. When you pull out the slide and try to push it in without inserting a penny, it won't budge, for the simple reason that a wooden catch has engaged with the slide slot. When a penny is inserted, it lifts the catch out of the slot. As a further precaution against "robbers" in the household, it is the coin which pushes the matchbox into the chute aperture.

The article is fool-proof against buttons, half-pennies and poking with needles and hair-pins.

Centre Page Patterns

The whole gadget is made from $\frac{1}{4}$ in. birch plywood, full size patterns being provided in the centre page spread. It will be seen that there are several repeats to be made—indeed, the patterns should be studied carefully before cutting and pasting or tracing to the wood.

For instance, the pattern giving the left-hand

side also gives those of the right-hand side. By looking at the photographs, you will see how they must be cut. The same pattern gives the lock cover, lock casing (in black) and catch (dotted). The casing and catch should be marked out together as shown, then cut out from the one piece of wood. Indicate the pivot pin mark on the catch, cover and side.

The pattern of the back gives the

door which has small projecting tabs at the bottom for hinging purposes. When marking out the parts, be sure to have the grain running in the direction indicated by the arrows.

How to Assemble

Having all the parts cut neatly with the fretsaw, select the back, left side pieces and bracket pieces. The latter is glued first to the top side piece, then glued to the back, the other half of the side going to same and the back.

At this point, glue the slide guide piece (this has a bevelled edge as in Fig. 1) to the mortise in the back, then glue the slot table to same, after which the slide can be inserted and the left-hand side adhered, the rounded tabs of the door being inserted to the sides beforehand, of course.

Glue the top and bottom in position. The chute pieces can then be attended to as shown in the constructional views, including the brackets lock clasp and door washers. The case should be cleaned over with glasspaper prior to following out this procedure.

Fixing the Locking Device

To fix the locking mechanism, first reduce the

thickness of the catch with glasspaper. Glue the casing evenly to the cover, then insert a pin through from the face side for the catch.

The pivot hole in the catch should be fairly big to allow it to swing freely, but not too much, lest the catch (which depends on gravity to work) should drop out of alignment and block the coin passage.

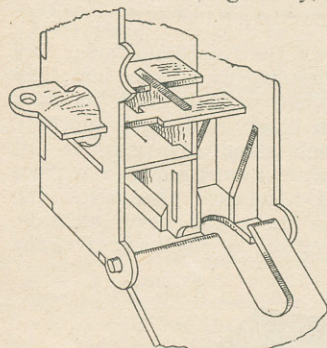


Fig. 1—Cut-away view of interior
the pin cautiously. Reduce it to $\frac{3}{8}$ in., then insert and file the interior of the box chamber to leave no

Having glued the lock casing, push the pin into its hole in the side and press it even so that the slide is sufficiently free. Turn the article on its side and withdraw the

and withdraw the

MATERIALS REQUIRED

2 pieces birch plywood 14ins. by 9ins. by $\frac{1}{16}$ in. thick.
1 piece mahogany plywood 4ins. by 2ins. by $\frac{1}{16}$ in. thick.
3 brass wall hangers (No. 6134).
1 small padlock.

Puzzles—(Continued from opposite page)

4 white, 4 black, 4 white, 3 black, 2 white, 1 black. After each step the vacant hole will be 15, 13, 12, 14, 16, 17, 15, 13, 11, 10, 12, 14, 16, 18, 17, 15, 13, 11, 12, 14, 16, 15, 13 and 14.

Second Problem

To this one there are more than one solution but the following, in forty-six moves, is probably the shortest. As before, there being only one vacant hole we give its number after each move.

8, 20, 24, 14, 21, 7, 2, 14, 26, 22, 8, 20, 14, 4, 9, 21, 7, 13, 20, 6, 12, 24, 14, 4, 16, 22, 8, 15, 21, 7, 19, 24, 14, 8, 20, 6, 2, 14, 26, 21, 7, 14, 4, 8, 20, 14.

Third Problem

The nine pegs must be placed in holes 5, 6, 8, 13, 14, 15, 20, 22, 23. This arrangement gives the following ten lines containing three, and only three, pegs:—5, 6, 8—5, 13, 22—5, 14, 23—6, 13, 20—6, 14, 22—6, 15, 23—8, 14, 20—8, 15, 22—13, 14, 15—20, 22, 23.

This solution is unique, and if the reader places the nine pegs in the holes as given, and tries to trace out for himself the ten lines, he probably will realise the difficulty involved in solving it.

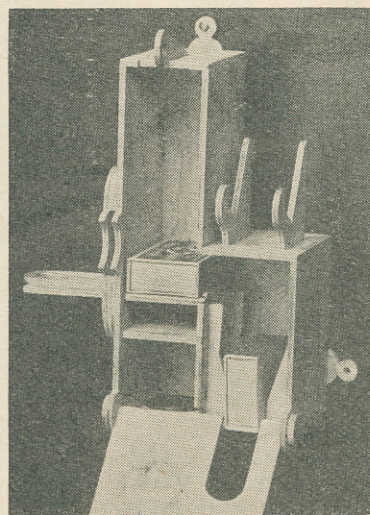
Fourth Problem

This puzzle, popularly known as the Tower of Hanoi, will seem highly complicated to the uninitiated, taking as it does, with eight discs, 255 moves to solve. Once, however, the basic principle has been mastered the process becomes automatic. Perhaps therefore, in testing your

chance of the pin end obstructing the matchboxes. A piece of bevelled wood is glued within the money compartment while the tipper pieces are adhered to the left-hand chute pieces.

The overlay is affixed in position as shown. Either plywood or brass hangers (No. 6134) can be attached to the back. To finish the work, it should be clear varnished or polished oak or mahogany.

Do not touch the interior, and for safety's sake, it would be better to leave the work in its natural state. The padlock used is obtainable from the 6d. stores, with two keys, for 3d.



Another view showing two boxes in place

friends' ability, six discs will be sufficient, and for these sixty-three moves will suffice for the solution.

Let us suppose the eight discs to be lettered consecutively from A the smallest, to H the largest; and also that primarily the discs are on peg eleven. Make the following moves:—

A to 11, B to 17, A to 17, C to 14, A to 11, B to 14, A to 14. Repeat this again and again, until you can move these three discs from any one peg to another.

Following this start, place D on 17 from 11 and transfer A, B and C by the method shown above onto D on 17. Move E onto the vacant peg, transfer A, B, C, D onto it as you have previously moved four discs. So you continue, transferring one disc from the original pile onto the vacant peg, then the increasing pile of smaller discs onto it, and another disc onto the now vacant peg.

There is only one other fact to grasp. When you have just moved a disc from the original pile to a vacant peg, count the number in the pile of smaller discs which you are about to transfer onto it.

If it is even, start by moving the top disc onto the original pile; if it is odd move the top disc onto the peg to which you are transferring the whole pile. This is important, for if you ignore it, you will reach an impasse and have to retrace your steps.

The explanation may seem at first a little formidable but on applying it to the puzzle will soon become quite clear, and the process, as we have said will become automatic.

FOUR PUZZLES IN ONE!

A Board Game which you can make and enjoy

READERS who are interested in wooden puzzles will fully appreciate this 4-in-1 compendium. A small piece of work, easily and quickly constructible from odd pieces of wood, it is neat and compact. It can, in fact, be stored in a flat cardboard or 3-ply box in. by $3\frac{1}{2}$ in. by 1 in. approximately.

The base, for which some hard wood such as beech is particularly recommended, is primarily in. by $3\frac{1}{2}$ in. by $\frac{3}{4}$ in. Draw lightly in pencil a border, $\frac{3}{4}$ in. from the sides, in. from the ends, and dividing the resultant 8 in. by 2 in. oblong into a network of 2 in. squares, mark the centres of the 27 holes shown in the diagram.

With a radius of $1\frac{1}{4}$ in. shape the ends of the base into semi-circles, and bore $\frac{3}{4}$ in. holes right through the base at the points already marked. Back with $3/16$ in. plywood and clean up the face, removing all traces of the marking out and burr.

Join the seventeen holes in the centre of the board by painting the heavy diagonal lines as shown. Add a coat of clear varnish and the base is complete.

Pegs and Rings

Cut sixteen 1 in. lengths of dowel rod to fit easily, but not too loosely, into the holes. Round off one end of each, and paint them in two sets of eight each in two distinctive colours; or leave one set natural and paint the other. Three further pieces of dowel $3\frac{1}{2}$ in. long, to fit tightly into holes 11, 14 and 17, have one end rounded as before.

Eight rings of $3/16$ in. plywood, each with a $\frac{3}{4}$ in. hole in the centre, but of varying outside dimensions, will be needed. The largest has an outside diameter of $2\frac{1}{2}$ in., and the diameter of each successive ring decreases by $\frac{1}{4}$ in. to the smallest— $\frac{3}{4}$ in.

The edges of the centre hole of each are nicely rounded, but only the upper edge of the outside. If desired, these rings may be varnished and this will finish the construction.

The First Puzzle

For the first problem place four pegs of one colour in holes 10, 11, 12 and 13; four pegs of the other colour in 15, 16, 17, 18. Thus only hole 14 is empty in the line of nine holes, to which this puzzle is restricted.

It is required to interchange these two sets of pegs, subject to the following conditions:—

- A peg may only be moved in one direction—towards its ultimate position; no backward moves of any kind being permissible.
- A peg may be moved, in the right direction to the vacant hole if adjacent; or
- If next but one to the vacant hole, and

separated by a piece of the opposite colour, a peg may leap over, as at draughts.

Thus it will be seen that the first move must be either peg 13 or 15 to hole 14.

The Second Puzzle

For the second, place the eight pegs of one colour in holes 2, 7, 6, 13, 20, 12, 19 and 24, the other set in 4, 8, 9, 15, 21, 16, 22 and 26. This time they may only be moved in the holes joined by the lines, so that again hole 14 is the only one vacant. The conditions for problem figure 1 also apply here, and in addition the pegs must move along the marked lines.

Thus a peg starting at 12 may be moved to the vacant hole if it be 6 or 19; or if 2 or 24 is vacant and separated by a peg of the opposite colour, 12 may jump over.

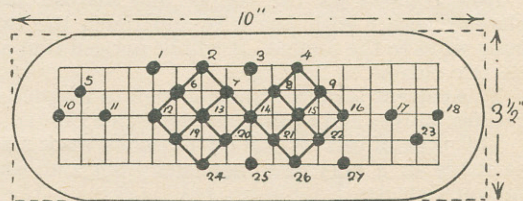
Whilst of the same type as the last, for the two sets have to be interchanged, this problem is far more difficult and extremely intriguing.

Two More Puzzles

The third puzzle is to place nine pegs (the colours this time do not matter) into any of the holes, to form ten lines of three pegs each—three and no more. This too is far from easy.

Perhaps however, the fourth is the most difficult. The three long pieces of dowel are fixed in holes 11, 14 and 17, and the eight discs dropped onto one of the end pegs, in order, so that the largest is at the bottom, the smallest at the top.

The discs are to be moved one at a time from one peg to another, until the whole series has been transferred from the first to another peg,



on which, they must again be in order as before. At no time during the manipulation must a disc be rested on one smaller than itself, and remember, only one disc at a time may be moved.

Readers will, no doubt, want to try these puzzles themselves, after having made them. The answers therefore are herewith, but it is much more exciting to work them out for yourself first if you can.

First Problem

If the two sets of pegs are coloured black and white, move successively 1 black, 2 white, 3 black,
(Continued on opposite page)

The AMATEUR ELECTRICIAN

CELLS FROM ODDS AND ENDS

ANY fellow who is at all interested in electricity can obtain a great deal of amusement—and knowledge—by constructing and experimenting with the various forms of primary cells and batteries. And all at the cost of a very few pence.

Most radio and electricity enthusiasts have some odd corner, "cubby hole" or workshop littered with an accumulation of old jars, scraps of zinc and copper, worn out dry cells and so forth—the very material for a number of highly interesting experiments.

Take a lemon, cut it in half and probe into the various segments with a piece of wire or knife blade to break up the "flesh" of the fruit and liberate the juice. Care must be taken not to damage the walls of pith which separate the various segments.

Now take a number of small pieces of zinc and copper and push one into each segment of the

is to cut a top for the cell from a piece of stiff cardboard. This, however, should be well coated with wax or it will soon be attacked by the corrosive electrolyte.

This one—involving the same principle as the "lemon battery"—is very easy to construct. Copper and zinc plates are used as in the first experiment, but the electrolyte consists of a weak solution of sulphuric acid instead of the juice of a lemon. (Fig. 2).

If the two plates are connected together, a current of electricity will flow from the copper plate (+) to the zinc (—).

A Bi-chromate Cell may be constructed from zinc and carbon rods similar to those used in the Leclanché cell, but in this case the electrolyte is made up as follows:

- 2 ozs. Sulphuric Acid.
- 2 ozs. Bi-chromate of Potash.
- 1 pint water.

Remember to pour the acid slowly into the water, and then add the bi-chromate of potash when the solution is nearly cool.

Another point to remember in connection with these primary cells is that the electrolyte is constantly attacking the zinc plates, so that it is advisable to withdraw them from the solution when not in use.

A Home-made Cell using zinc and iron for its negative and positive elements may easily be made with the aid of an empty tin and a small plant pot. Place the plant pot inside the tin (a two-pound

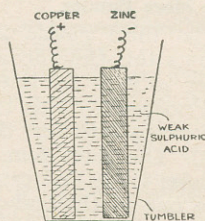
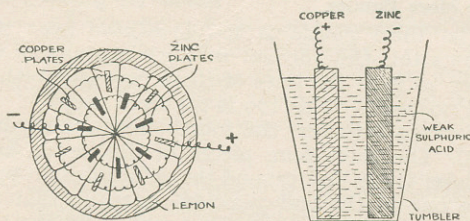


Fig. 1—Leads from the lemon Fig. 2—The tumbler cell

lemon. Place them alternately—copper, zinc, copper, zinc—until each segment has its plate.

Now connect all the copper and all the zinc plates together with fine wire and touch the two main wires to the tongue. It will be noticed that an electric current is flowing.

This current is quite strong enough to magnetise needles, knives and similar articles. (See Fig. 1).

This type of cell for bell or telephone work may be made in a very few moments from zinc and carbon rods.

The carbon rods are easily obtained from old dry cells, and almost every household boasts one or two partly-used zinc pencils from worn-out Leclanché cells. (New zincs, by the way, may be obtained from the local ironmonger for fourpence). An old tumbler or jar makes an excellent container for the electrolyte—a solution of sal-ammoniac (ammonium chloride) in water, and the construction of the cell is shown in Fig. 3.

Strips of old bicycle tyre or insulating tape are wrapped round the carbon at top and bottom to prevent the rods touching, and they are then bound together by means of rubber bands.

An alternative method of keeping the rods apart

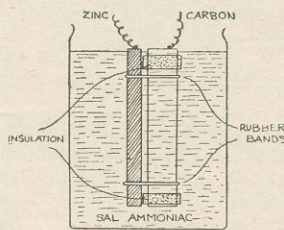


Fig. 3—A simple Cell

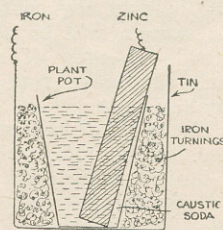


Fig. 4—Section of plant pot

syrup tin serves the purpose admirably) and pack the surrounding space with coarse iron filings or turnings. (Fig. 4).

Now place a zinc rod or plate inside the porous pot, fill up with a solution of caustic soda (sodium hydroxide) and the cell is ready for action. It must be remembered in all experiments dealing with strong acids and alkalines, even in dilute solutions, that they are extremely corrosive, take great care to protect clothes, tables, etc., and never leave an open cell where it may spill and so cause damage.

A SOILED LINEN BOX

HERE is an article that is both interesting and instructive for an amateur to try his hand at.

It combines carpentry and fretwork, and being based on the modern style of flush construction that is the trend of modern taste, it is, when finished, and if tackled with exactness and patience, a very useful piece of furniture. This can be either polished or painted to match any existing bedroom suite.

How to go to Work

Take corner posts and mortise in top and bottom as shown in Figs. 1 and 2. Sufficient is allowed on these to saw off flush to face of stripwood rails when glued and pinned together. Rails when fixed will come up to back face of rebate in corner posts. Check up dimensions of front, back, and side panels with those that will be allowed when framework is fixed together.

If necessary trim all edges of these to allow them to fix flush and true into frame. Glue and pin in position. Drive home pins with fine tipped punch.

Take the $\frac{1}{2}$ in. ply panel for bottom, and cut away corners to allow it to drop right into bottom of box. Corner pieces of which when cut out should exactly tally with that part of corner posts revealed inside the box. Pin in position on top of bottom rails of main structure.

Next take the 4 pieces of stripwood supplied for

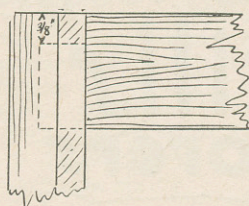


Fig. 2—The rails with tenons $\frac{3}{8}$ in. \times 1 in. \times $\frac{1}{2}$ in.

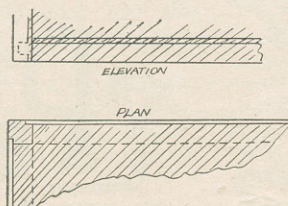


Fig. 4—Plan and elevation showing floor and cut-out corners

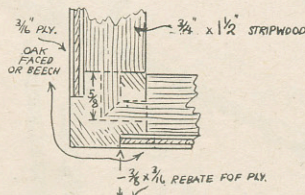


Fig. 1—Detail of the corners with mitred tenons

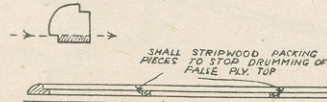
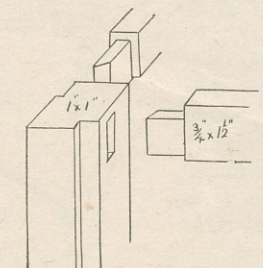
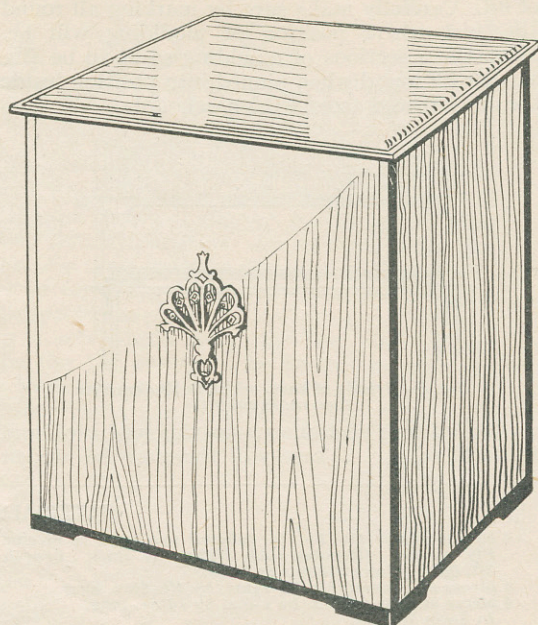


Fig. 3—Section of the Lid



Rails fitting into corner posts



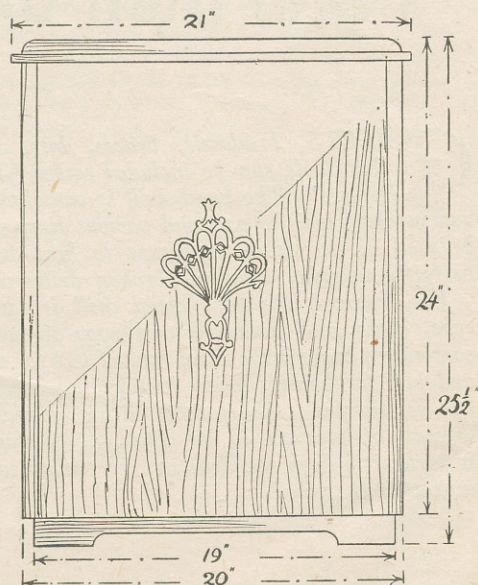
base and shape out as shown. Mitre corners of each piece (see Fig. 5) so that when placed together, the whole will be a framework 1ft. 7ins. by 1ft. 1in. overall measurements. Pin and glue together.

This base piece will be found to sit $\frac{1}{2}$ in. in all round when placed on to bottom of main box. Screw in position.

Bottom rails and corner posts all being flush with one another, a perfect seating is thus ensured for base piece.

Lid Parts

Next take panel for bottom projecting portion



Elevation view with fretted panel on front

of lid. Carefully make sure by marking all round $\frac{1}{2}$ in. just where position of moulding will be. Mitre the 4 sections of moulding so as to be $\frac{1}{2}$ in. smaller all round when pinned into position inside the mark traced around the baseboard.

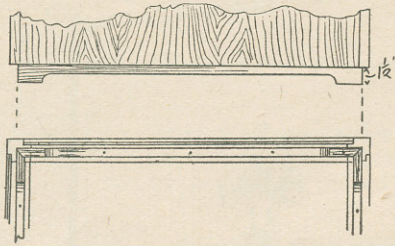


Fig. 5—Details of base, which is $\frac{1}{2}$ in. smaller than main cabinet

Glue all four sections on to this and pin from inside of rebate. These will therefore be hidden

when top panel is placed within the rebated framework caused by moulding.

In order to avoid the drawing of this top panel, glue across the 2 pieces of stripwood as shown in sketch 3.

In fixing, top lid must project $\frac{1}{2}$ in. all round beyond face edges of box.

Best results can be obtained when hinging lid, by recessing back of box section to take complete double fold of hinge. The top leaf of which can then be screwed straight on to underface of lid. When shut this should be down flush on to box.

When fixing fretted ornament, mark out centre of front by intersection of the diagonals—glue into position. Take oak button and glue and pin into centre of ornament.

Sand the whole article off with fine glasspaper, and stain and polish or paint as desired.

MATERIALS REQUIRED

- 4 corner posts—1 in. by 1 in. rebated two ways to receive Ply panels. (Rebates each $\frac{3}{16}$ in. by $\frac{1}{2}$ in.). Length 2 ft. 0 ins. (Satin Walnut or Oak).
 - 4 pieces stripwood, $\frac{1}{2}$ in. by $1\frac{1}{2}$ ins. by 1 ft. 8 ins. long.
 - 4 pieces stripwood, $\frac{1}{2}$ in. by $1\frac{1}{2}$ ins. by 14 ins. long. In Satin Walnut.
 - panels $\frac{3}{16}$ in. Oak Plywood for front and back. 1 ft. 6 $\frac{1}{2}$ ins. by 1 ft. 11 $\frac{1}{2}$ ins.
 - 2 panels $\frac{3}{16}$ in. Oak Plywood for sides. 12 $\frac{1}{2}$ ins. by 1 ft. 11 $\frac{1}{2}$ ins.
 - 1 fretted ornament (or material to make).
 - 1 Oak leaf pattern button for centre of ornament.
 - 1 panel $\frac{1}{2}$ in. by 1 ft. 7 $\frac{1}{2}$ ins. by 1 ft. 1 $\frac{1}{2}$ ins. cheap birch plywood for bottom.
- The above materials make main box.

- 1 panel $\frac{1}{2}$ in. by 1 ft. 9 ins. by 1 ft. 3 ins. Birch Plywood for base board of lid.
- 1 panel $\frac{3}{16}$ in. by 1 ft. 7 ins. by 1 ft. 1 in. Oak Faced Plywood for top face of lid.
- 2 pieces 1 ft. 8 ins. and 2 pieces 1 ft. 2 ins. rebated moulding as pattern 304 but single rebate only. (Bottom member cut off as in sketch).
- 2 pieces 12 $\frac{1}{2}$ ins. of $\frac{1}{2}$ in. by $\frac{1}{2}$ in. deal stripwood.

BASE.

- 2 pieces 1 ft. 7 ins. $\frac{1}{2}$ in. by 1 $\frac{1}{2}$ ins. Stripwood.
- 2 pieces 1 ft. 1 in. $\frac{1}{2}$ in. by 1 $\frac{1}{2}$ ins. Stripwood.

ODDMENTS.

- 1 pair brass hinges and screws.
- 1 pair lid stays No. 5495.

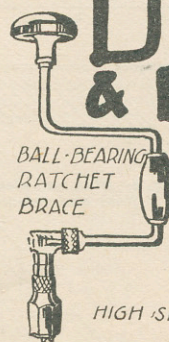
Tools and their uses

GIMLETS, bradawls, braces, bits, and many other tools can be included under "Drills and Borers." The hand drill is one of the simplest and quickest tools to use, and various sizes of bits can be used in it. It is important to keep hand drills perfectly upright, otherwise broken drills will result.

For fretwork the high speed drill is far the best type, being well balanced and easy to work. The carpenter's brace is the usual type of tool for woodwork, and bits for boring, screw-driving and countersinking can be inserted. The ratchet fitting enables a larger amount of pressure to be obtained, but again it is important to keep the drill strictly upright or at right angles to the wood.

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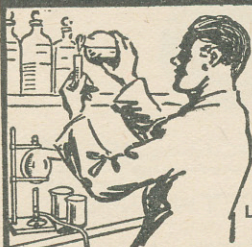
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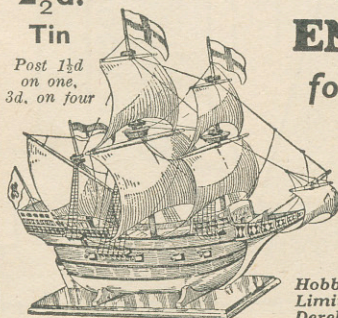
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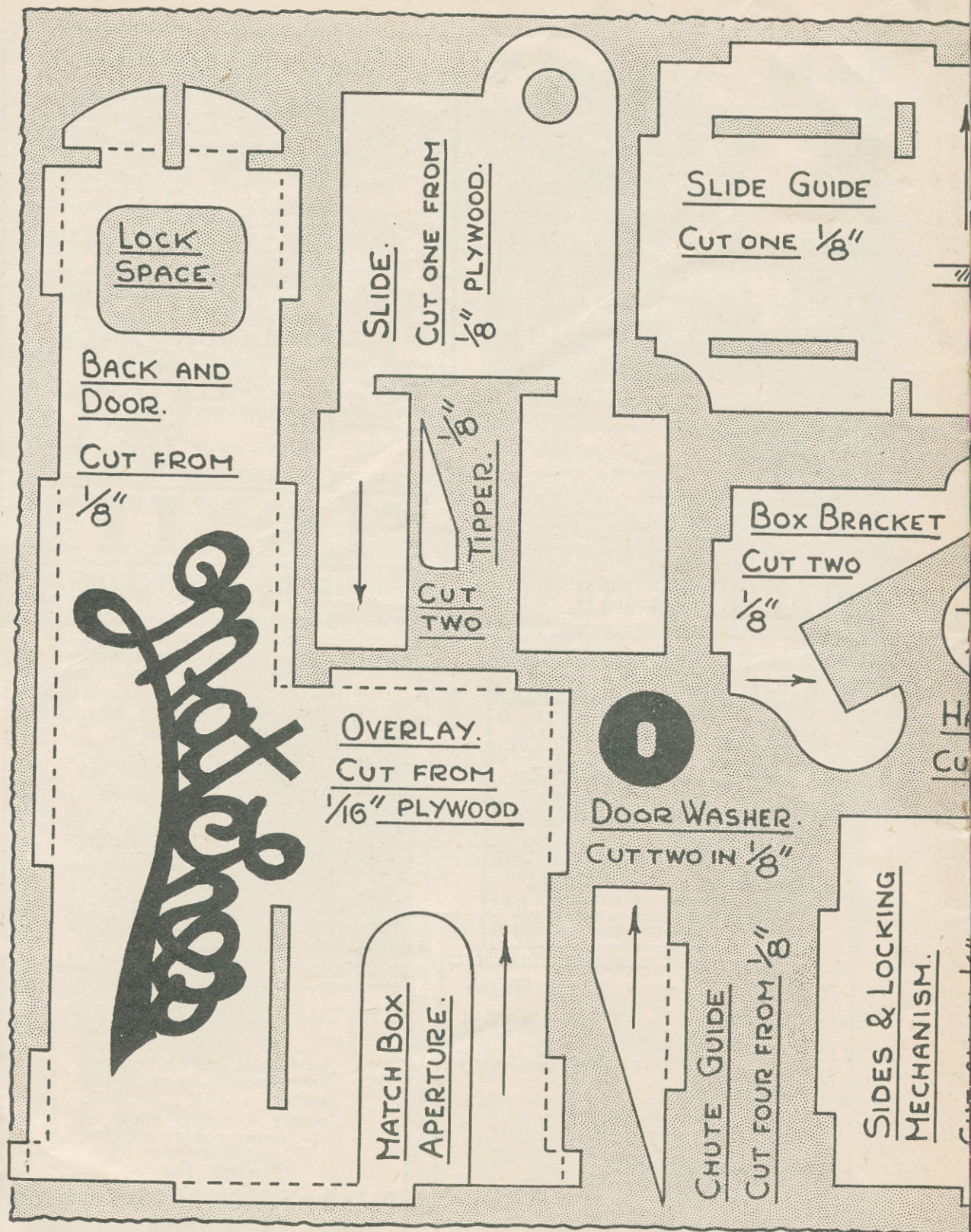
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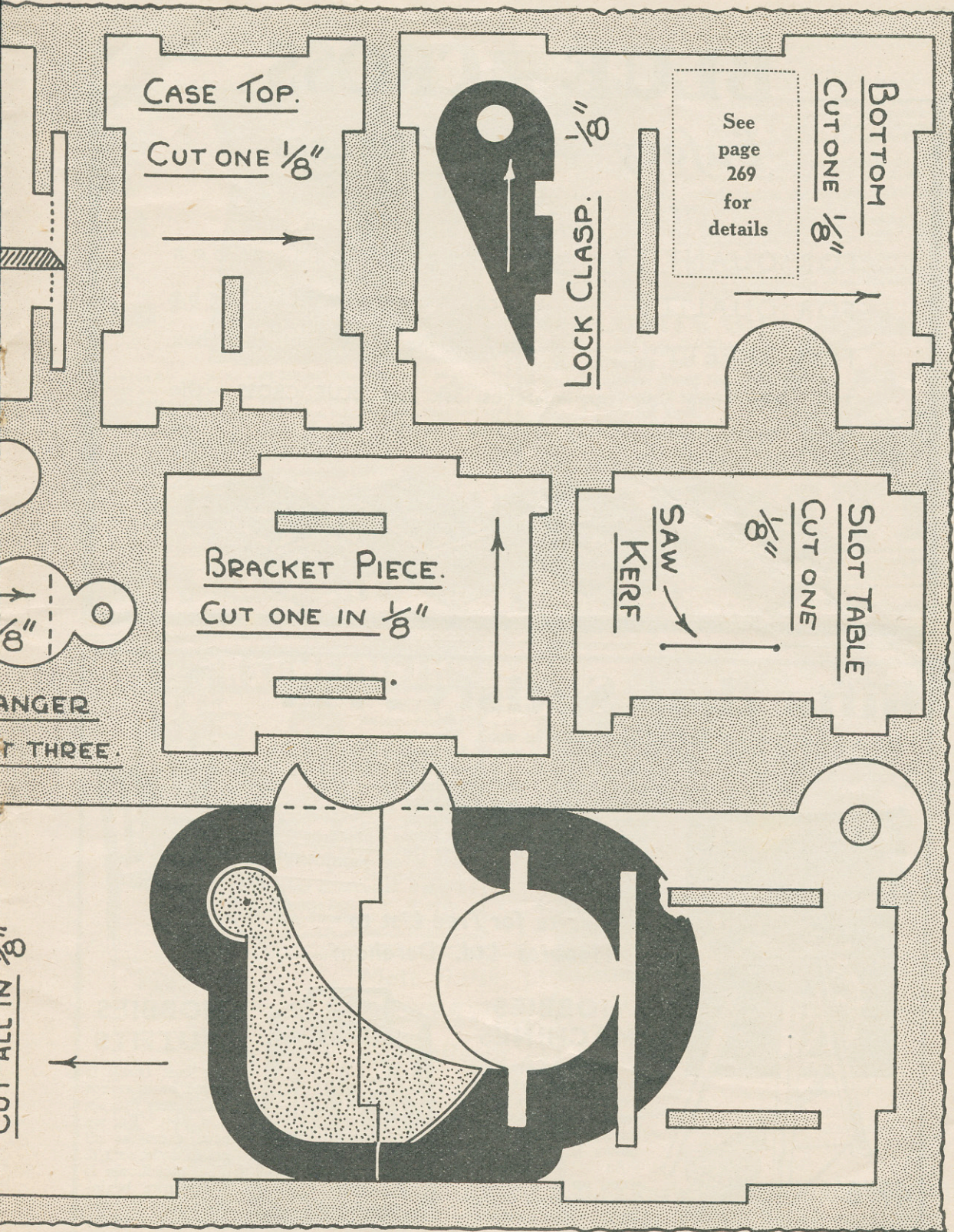
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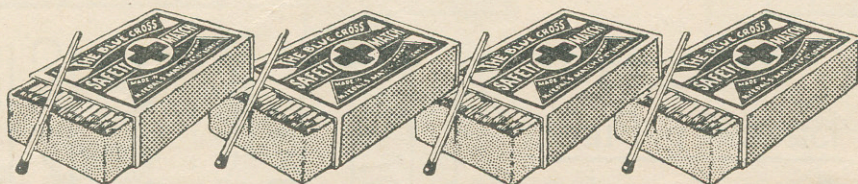
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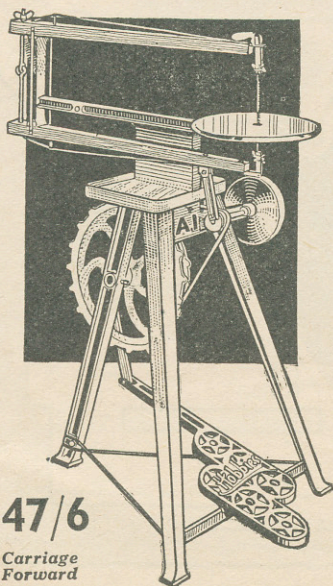
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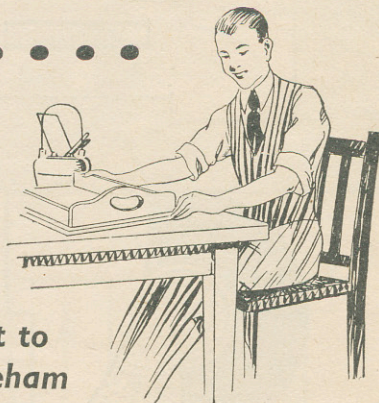
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A NOVEL GRIP TESTER

HERE is a splendid piece of work that our "he-men" readers will especially appreciate; a novel grip-testing machine that will provide endless amusement during the darker evenings.

The main requirement is, of course, a good spring. For this any length between 6ins. and 9ins. will do, provided its strength is such that when pulled in the hands it can be stretched about a couple of inches.

The principle of the machine will be quite clear when it is understood that the dial is not actuated by the spring itself, but by a thread that is fixed on the handle, underneath the spring, and which works backwards and forwards with it. A glance at Fig. 8 will immediately make this clear.

The Framework

Make a start with the frame of which Fig. 2 gives all the necessary dimensions. All the parts are cut from wood $\frac{1}{2}$ in. thick, with the exception of the piece of 1in. dowelling. Fig. 7 shows how they are fixed together.

Three partitions, identical in size, are also required. Two of them are cut from wood $\frac{1}{2}$ in. thick, and one from $\frac{3}{4}$ in. It will be seen that the two thinner ones have $\frac{1}{2}$ in. holes in them to carry the handle, whilst the $\frac{3}{4}$ in. piece is for the other end of the spring to be fixed to. This thicker piece is drilled to let the cord pass through it, underneath the spring.

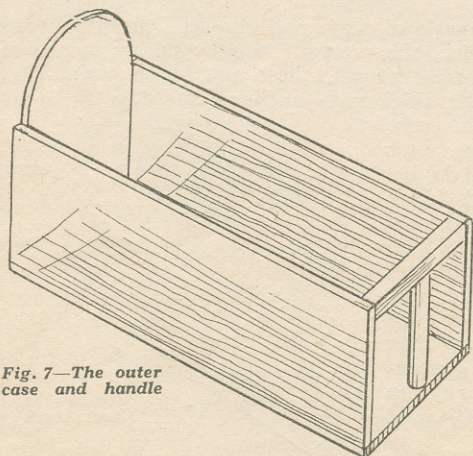


Fig. 7—The outer case and handle

Make up the handle from the four pieces of dowelling as shown at Fig. 5. It will be seen that the two thinner partitions act as runners for this handle. So these must be threaded on to the thin pieces of dowelling before the final piece of the handle is fixed in place.

Fix a screw-hook into this last piece of the handle (for the spring to be hooked on to), and then these two partitions, with the handle suspended in them, can be fixed in their place in the framework. This will be clearly seen at Fig. 8.

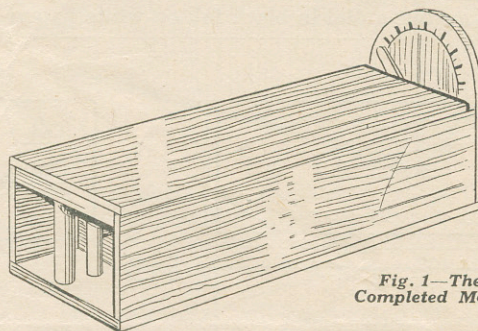


Fig. 1—The Completed Model

Now screw another hook into the centre of the remaining partition, place it in the frame temporarily, and secure the spring to both hooks. You will then see just where this thicker partition needs to be fixed. Its position will necessarily vary a little with the length of your spring.

The Spindle

When this partition is fixed it will readily be seen just how long the spindle needs to be. This spindle (cut from $\frac{1}{2}$ in. dowelling), reaches from the partition to the end of the frame (see Fig. 8), and is held in place by two pins. Glued to it are three discs of $\frac{1}{2}$ in. wood, each 3ins. in diameter, as shown at Fig. 6.

On to the first of these discs is glued the pointer, a thin strip of wood $4\frac{1}{2}$ ins. long. The centre one has fixed to its edge (by means of a drawing pin), the thread which actuates with the spring.

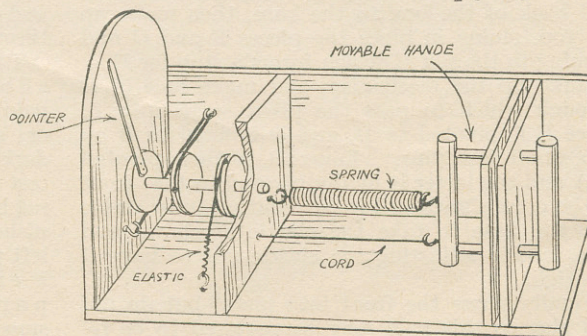


Fig. 8—A cut-away view showing construction

The other disc also has a thread pinned to it, but this simply leads to an elastic band (see Fig. 8), which acts as a spring to pull the pointer back to zero when the spring is relaxed.

The two discs that have cord pinned to them need a groove making round their edge, to prevent the cord from slipping off.

Fig. 8 shows clearly how thread that actually works the pointer is fixed in. It is pinned to the handle, passes underneath the spring, through the thick partition, through a ringed screw in the end of the frame, on through another ring in the side of the frame, and from there is pinned on to the middle disc.

As the handle is pulled, this cord turns its corresponding disc round a little, and the pointer disc, being on the same spindle, turns with it, to register the grip.

Draw out a dial in black ink on white paper, as

shown at Fig. 9, and glue it into place on the end of the frame where the pointer is.

Before fixing on the top, do a little "strong man stuff" on the machine to see if its range suits your grip. If you find you can pull the pointer round to the maximum too easily, use a bigger disc in the middle. If you cannot make enough impression to measure accurately, fixing the cord to a smaller disc will magnify it more on the dial.

Pieces.	Description.	Length.	Width.	Thick.
1	Bottom.	1ft. 6ins.	8ins.	$\frac{1}{2}$ in.
1	Top.	1ft. 5 $\frac{1}{2}$ ins.	8ins.	$\frac{1}{2}$ in.
2	Sides.	1ft. 6ins.	6ins.	$\frac{1}{2}$ in.
1	End.	7ins.	9 $\frac{1}{2}$ ins.	$\frac{1}{2}$ in.
2	Partitions.	7ins.	6ins.	$\frac{1}{2}$ in.
1	Partition.	7ins.	6ins.	$\frac{1}{2}$ in.
1	Fixed Handle.	5ins.	1in. Dowelling.	
2	Moving Handle.	5ins.	1in. Dowelling.	
2	Moving Handle.	6ins.	$\frac{1}{2}$ in. Dowelling.	
1	Handle Stay.	7ins.	1in.	$\frac{1}{2}$ in.
1	Pointer.	4 $\frac{1}{2}$ ins.	$\frac{1}{2}$ in.	$\frac{1}{2}$ in.
3	Discs.	3ins.	3ins.	$\frac{1}{2}$ in.
1	Spindle.	About 4ins.	$\frac{1}{2}$ in. Dowelling.	

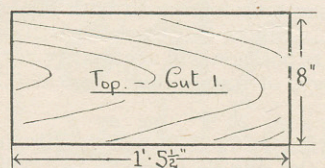
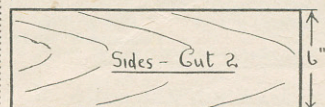
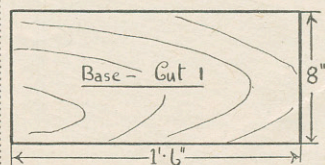


Fig. 2 - The framework
Fig. 3 - The partitions
Fig. 4 - The fixed handle

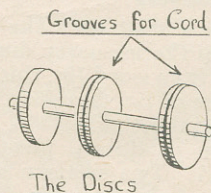
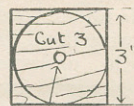
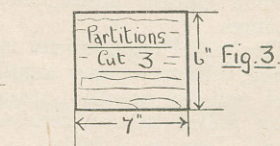
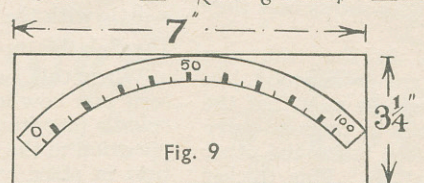
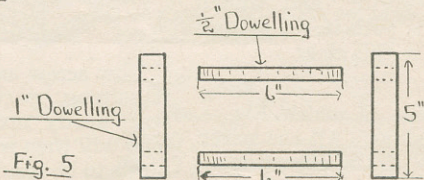
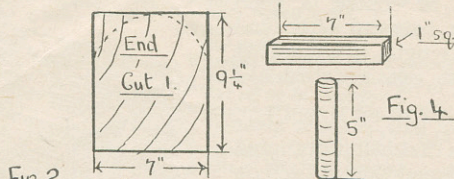


Fig. 5 - The movable handle
Fig. 6 - Disc and spindle
Fig. 9 - The test dial

Money Box—(Continued from opposite page)

with glasspaper before being fixed to the box. The method to follow in putting the parts together will be as follows. First screw the sides and back of the box to the base, then make up the top, gluing in place the pieces F and G and running in the pin H which forms a stop for E.

Make up the mechanism and make hole in E through which to pass the pivot screw into F. Piece E is pivoted to D, and D is fixed to B by two small fret pins. Lever B is then pivoted to A and the latter is finally pivoted to the front at the cross shown in Fig. 1. Put a pin or staple into the base to take the elastic as shown and take care in adjusting the elastic not to have it too tight.

Finally screw the front into place, but do not add glue as this part may be required to be removed from time to time to make adjustments

or renewals of parts and elastic. One last word of advice, the cat can be enlarged by means of the squares shown, these should be made $\frac{1}{2}$ in., and the thickened outline carefully followed through each.

The cat should be painted black or stained dark, while the rest of the box might be varnished or even left plain after being glasspapered up smooth and clean.

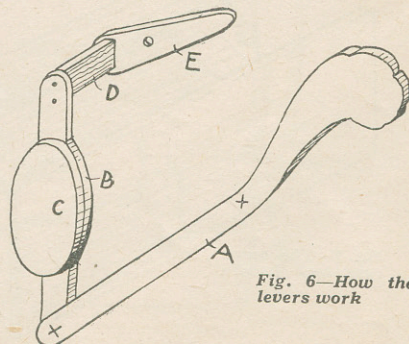


Fig. 6—How the levers work

THE "LUCKY CAT" MECHANICAL MONEY BOX

HERE is another little novelty which we anticipate will "catch on" with our fret-workers. It is not difficult to make, once the parts are cut accurately and the positions of the various pivots set in proper positions, all should drop together and fix quite simply.

The idea of the working of the novelty is this, A coin is placed in the slot in the top of the box, seen in section in Fig. 1, and this coin rests upon the lever E. Until the tail, which is at the end of lever A, is pressed down, the coin will not drop into the container.

The Mouth Opens!

As the tail is lowered, the disc C which comes immediately behind the slot in the front of the box and which forms the mouth of the cat, is raised and shows the mouth as being open. On disc C is painted the shape shown in red, white and black.

When the coin has passed the lever E, the latter is again brought to its original upright position by a piece of elastic fixed at the lever extremity of arm A and to the floor.

Thus it will be seen that until the tail is depressed the coin in the slot will not drop.

The Box Construction

The construction of the box is partly shown by the plan of the top in Fig. 2. Here it will be seen that there is a back and a front with two sides glued in between them, the top is cut to the sizes shown, the sides each being $4\frac{1}{2}$ ins. by 2 ins. by $\frac{3}{16}$ in. thick. In one of the sides is cut the recess shown in Fig. 3, this is to allow of the tail lever A to work in.

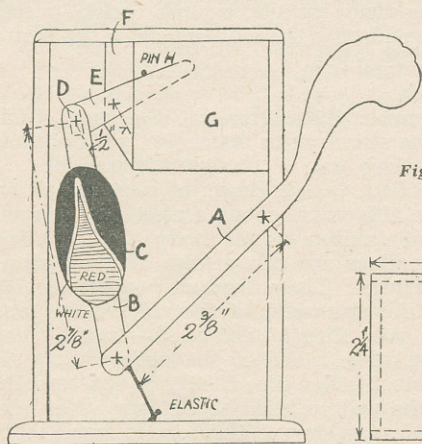


Fig. 1—A section showing the movement

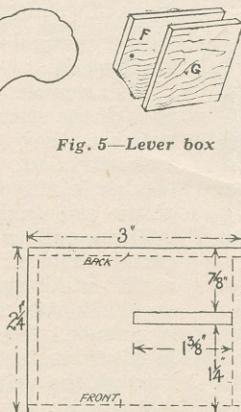


Fig. 2—The box top with slot

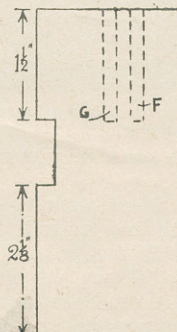


Fig. 3—One of the sides

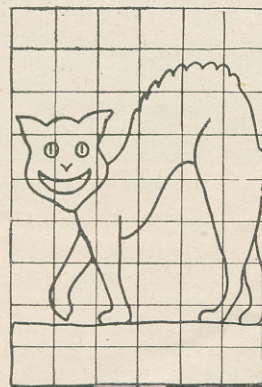
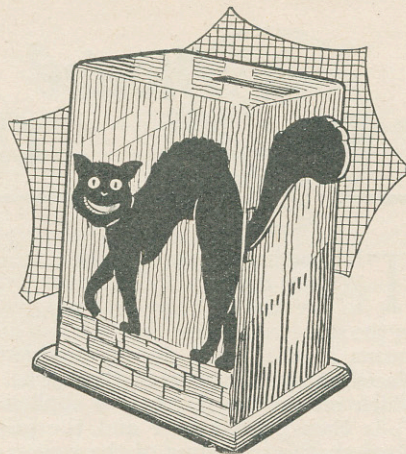


Fig. 4—The front, with cat outline



Press the
tail and the
cat
"laughs"!

Both back and front of the box measures $4\frac{1}{2}$ ins. by 3 ins. by $\frac{3}{16}$ in. and in the front there is cut a curved slot to represent the mouth of the cat, the proper position of this slot being obtained from the squared diagram Fig. 4, this figure of the cat may be either painted on the wood direct or it may be cut out to look more realistic from thin wood.

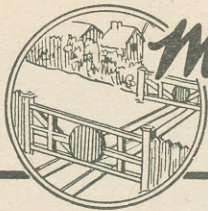
To one of the sides of the box—that which has the recess cut in it, is glued two partition pieces, F and G, F measuring 2 ins. by $1\frac{1}{2}$ ins. and G $1\frac{1}{2}$ ins. by $1\frac{1}{2}$ ins. and both from $\frac{3}{16}$ in. wood. In F is made a hole for a pivot screw to take lever E. In Fig. 5 the shapes of the two pieces are clearly indicated.

Arrangement of Levers

The arrangement of the levers is shown in Fig. 1 and the extreme lengths are, A, $5\frac{1}{2}$ ins., B, $3\frac{1}{4}$ ins., C, (an oval disc) $1\frac{1}{2}$ ins. by $\frac{3}{8}$ in., D, $\frac{3}{4}$ in., and E, $1\frac{3}{4}$ ins. tapered towards one end as shown. All these parts are $\frac{3}{16}$ in. thick and are cut with the fretsaw, the ends being carefully rounded off and clean holes bored for the pivots. Glue the disc C to lever B as shown again in the diagram of the built-up levers at Fig. 6.

The base of the box measures $3\frac{1}{2}$ ins. by $2\frac{3}{4}$ ins. by $\frac{1}{4}$ in., and its top edges should be rounded off

(Continued on opposite page)



Model Railway Accessories

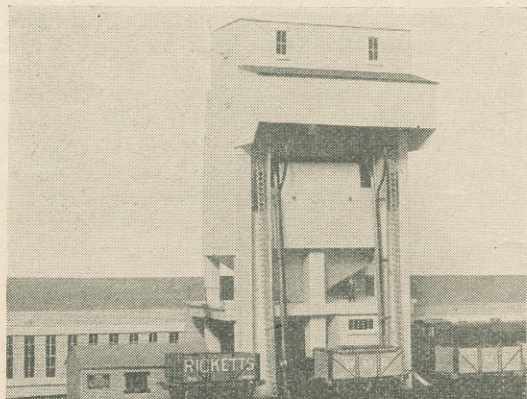
OO GAUGE COAL HOIST

THE method of operating the stage is as follows. Wagons are run under locomotive power on to the track of the lift, and there centred. In the same movement they are also uncoupled by means of the Lanal uncoupling ramp which is placed on the lift between the tracks. The lever which retains the wagon-grip appliance (see Fig. C) is then pushed over and the grip falls into place on the top edges of the wagon sides. The operating crank, shown at the right top side of Fig. B, is then turned so as to hoist the cradle by the sprocket chains.

On reaching the throw-back portion of the lift-runnels, the top of the cradle tilts automatically backwards, and the continued movement draws the front of the cradle upwards, until it gradually is completely inverted, the wagon remaining meanwhile rigidly in place. The coal is dumped into the bunker and falls immediately down the chute into the receptacle below the baseboard.

Lowering the Cradle

As this fills up it can be detached by withdrawing the sidescrews (which are simply a push-in fit) and the coal can be emptied at the pithead. Reversing the movement of the crank, the wagon cradle immediately begins to right



The stage with wagon on the deck and gripped ready for raising

itself, sinks sweetly into its place on the runnels, and is lowered.

The cradle grip is then raised with the finger and the retaining lever is thrown back to hold it up, after which the wagon is pushed off by the locomotive. In the photo shown in the first article the wagon cradle is in readiness to receive the vehicle. In the accompanying photo, the wagon has run into its place and the grip has been released. It will be seen resting on the wagon-top.

The various mechanical features involved in the operation can be clearly seen in the perspective sketch Fig. C. This shows the cradle, the front portion of the base, the wire-made grip appliance, the wheel runnels of the lift, made of OO-Gauge running-rail, the counterweight channels already described, the tabs which serve at each side of the base to hold up the entire stage in its cavity in the main baseboard of the layout, as well as the pulley-wheels which run over the runnels at the sides of the cradle.

NOTE

This article is a continuation of one commenced in our issue dated November 20th. The drawings mentioned here were printed in that article.

It also shows the lower part of the rod-retainers for these runnels, and how the brackets on these are specially shaped and soldered to clear the pulley-wheels. The method of fixing the top end of these perpendicular rods (consisting of cage-wire) is shown in Fig. H.

Fixing the Rods

The rod-top is bent back and fits tightly into a hole in the special short length of stripwood prepared for it behind the corner column. The base of this rod, the rod which carries the brackets of the runnels, slips down into a hole in the base of the stage. It is thus obvious that these rods, carrying the runnels, can be readily detached, piecemeal with the runnels themselves, at will.

The brackets are easily made from cage-wire, and should be soldered in one piece while flat on the bench, the niche to take the runnels being then snipped out. They are soldered to the rods by resting them upright against a right-angular block of wood, with the rod lying along the bottom of it on the bench.

The Runnels

The runnels themselves are the most tricky part of the structure to make, but with ordinary patience they are a straightforward job. To make the first, take a length of running rail and bend it in the centre about a piece of thick wire of the same calibre as the body of the pulleys.

These pulleys are taken from a famed stores' curtain fittings. The pulleys are just very slightly a stiff fit for the width of the rail, so the latter should be very slightly filed to fit—a mere shade is enough. The niche of the pulleys may also be filed out a little. See that they run smoothly through the pulleys, each of the four latter being tested. Having shaped the bottom bend of the runnels, the shaping of the rest is a matter of experiment, at all events for the first one.

Examine Fig. A, and mark the shape required and proceed to work. Get the position and exact shape of the fall-back loop next, and turn up the free end, cutting it off (the rear one) with an inch or so to spare. Then shape the front. See that in shaping the rail does not twist. The cradle should be at hand with the wheels in place (to be described next) and the size of the radius of the runnel-space is gauged by the position of these wheels.

It should be of such a size as to allow the cradle to turn in the runnels freely but without at any point allowing the pulleys to become dismounted from the rail. When the first runnel is ready, make the second to match it, which will be easier. The loose ends of each are then joined by an ordinary fishplate where indicated in Fig. A. Next fit the brackets in their exact places on the runnels.

Fitting the Brackets

This can be done by inserting a piece of stripwood of correct thickness between the parallel runnel-rails of each set and soldering the brackets (already attached to their rods) in the outside of the web of the rail. If any lumps of solder occur on the working sides of the rails this must afterwards be filed off, so that the pulleys will slide sweetly. Now fit the runnel rods on the stage, with the two runnels, as described, and begin to experiment.

Some word, however, must first be said about the cradle. The body of this is already finished. The wheels are attached with thin brass screws in holes first drilled to receive them in the ends of the cradle (Fig. D). They should not be a tight fit, but should spin freely.

The Counterweight

Later, if there is slight disparity in the positions of these wheels, thin washers (Merco) can be set in where wanted; though this should not be necessary. On being fitted, the wheels may be lightly oiled. The lead weight should also be at this point screwed on the underside back edge of the cradle. Note that it must clear the edge of the cross-piece at the front of the base when the lift is down in place.

Testing the Cradle

The main work next is that of experimenting with this cradle to get it working with infallible regularity and ease. This can be done in the hand, without counterweights or chains when the runnels are set in place. It may be necessary to spend four or five hours on this task alone.

The pulleys being necessarily a snug fit, any slight bends or twists in the lateral form of the runnels must be rectified by gently bending the brackets. But it is not feasible that serious trouble should occur.

When all is correct the hoist-gear may be installed. This is done by taking first a length of Meccano rod (axle) and drilling holes in the top side walls of the stage to receive it. These

must be right opposite one another. The axle, when inserted, should turn readily and should be absolutely in line with the top and front of the stage.

Lower Sprocket Wheels

The lower pair of sprocket wheels are carried on stub axles consisting of $1\frac{1}{4}$ in. iron bolts of exactly correct thickness to turn freely in the bore. These are back-nutted in place in the wall after the wheels are on, and after the latter have been spaced from the walls by additional nuts on the bolts.

The boss end of the wheels is in all cases set inwards, the position of the wheels being centred with the counterweight shafts. The top pair of wheels is similarly fitted with spacing nuts and the rod fitted in place immovably yet free to turn by soldering similar nuts on the outer ends. The crank is a piece of cage wire soldered on. Note that all four hoist wheels must spin freely.

Adding the Chains

The chains may now be added, care being taken that there are no twists in them. They are attached at one end to the counterweights and at the other to the pins (Fig. C) set as far back on the protruding ends of the cradle floor as possible. Link up the latter first, using long gim-pins with heads through the loops in the chain links. Then fit the counterweights, measuring the exact length of chain required to permit the cradle to rest at the base of the stage with the chains slack to allow the wagon free access.

The mechanism may now again be tested, and if all is absolutely right, the fishplates may be soldered in place on the runnels.

Wagon Grip

The wagon grip is easily made from cage-wire, and is clearly shown in the sketch Fig. C. Three pieces are necessary—the top bearer with the back uprights, the cross-piece at the top of the back, and the lower pivot length for the floor.

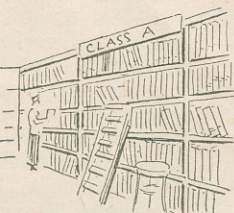
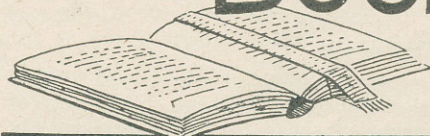
Solder this up to the size of the highest standard wagon to be used. Trim it with a file and pivot it with two hinged eyes made of pins, turning the pins over on the underside of the cradle floor. Then set another pair of similar eyes for the elastic band spring, also turning these up below. Loop over the elastic band and the grip is complete.

Note that the track is set to project over the gaps at the end of the cradle floor, which are provided to allow the sprocket chains free play. The tracks adjoin short sections on the special base with a clearance between of $1/16$ in.

The other constructional details are shown in Figs. E, F and G. E is the small dummy coal chute which goes over the track, and, made of stripwood with a piece of wire and a Merco brake wheel soldered on, glues on the underside of the bunker; see Fig. A. In F we have the dimensions of the special base; and in G we have the details of the cabin, which falls to be described in the next article.

(To be continued)

BOOKS WORTH READING



BELOW we have a review of some of the latest books which we think will be of particular interest to our readers. Further lists of books can be obtained from the addresses given, whilst books themselves are obtainable from the booksellers, or the publishers concerned. In the latter case it will be helpful if you mention *Hobbies Weekly* when you write.

Hohner Harmonica Band Book

By Sid. G. Hedges.

MOST fellows sometime or other play, or try to play the harmonica, but not many think of the possibilities of forming a band with it among their friends. The instrument is cheap to buy, simple to master, and pleasing in harmony, because you can now get the four parts of treble, alto, tenor and bass.

Proof of popularity of the Harmonica Band is seen in the increasing numbers and the fact that there is a National Harmonica Song Bands League which offers advice and which now has over 800 affiliated bands.

This helpful book on the subject is written by a conductor who has actually raised several of these bands, and who therefore knows what he is talking about. The subject is full of "meat," telling you how to play, what to play, where to play and even when to play. The composition of such a band of varying numbers is given, with actual programmes of varying lengths and quaint novelty items as well.

The idea of running such a band may appeal to some of our readers and this book would certainly be a big help.

(Published at 1/- by The Pilgrim Press, 16, Pilgrim Street, London, E.C.4.)

Three in a Trailer

By Ralph Henry Barbour.

THE trailer caravan holiday has come to be part of our summer season now, but we have not yet heard of it being taken up seriously by young fellows all on

their own. The idea, however, offers possibilities, and if this book is anything like true, the odd adventures which come along with it make it a holiday worth trying. Of course, not everyone can obtain a trailer from Dad as a payment for a debt, nor have the loan of a car to trundle one about the countryside. All the same there are other ways of doing these things.

The lads in the book, although flavoured strongly with American outlook, certainly get a "big kick" out of it, and an excellent and interesting story is spun by the author. It is written naturally and is full of more or less adventurous situations and episodes. The book is full of incident and follows a novel and imaginative story from beginning to end. Certainly something quite different from the usual.

(Published at 6/- by the D. Appleton-Century Company, Bedford Street, Strand, W.C.2.)

Leave it to Craddock

By Hylton Cleaver.

EVERY fellow enjoys school yarns of the best type, and we have a new one here written by a master of the subject who has already won favour for his vigorous style and delightful stories. "Leave it to Craddock" is a book with quite an original plot, and one which grips the interest from the start.

It is certainly most unusual to learn of a school where the scholars are leaving—with the exception of the scholarship boys—owing to a cloud of suspicion resting on the Headmaster for converting the school income to his own ends. Masters and boys are leaving, the building is dilapidated and worn, and everything seems to be going to the dogs. But Craddock, stout fellow, decides to alter it all, and as captain of the school sets out strenuously to bring back the former prestige.

He is backed up by a jovial fellow named Hopkins, his fag, but runs into awkward opposition from the typical cynic and bully—Venables.

How the mystery attaching to the lovable Head, is worked out and in what way the school regains its honourable position, are worked out in a reasonable and pleasant manner with no little adventure and excitement. Altogether a gripping school yarn for the Christmas vac.

(Published at 3/6 by Frederick Warne & Co., Ltd., 1, Bedford Court, London, W.C.2.)

Everyday Art at School and Home

By Miss D. D. Sawyer.

WE have already mentioned the works of this highly qualified artist-writer in these pages, and find as much interest as ever in this new edition of a 244-page book. Anyone at all interested in art work—nature—model architectural—painting—leather work—lettering—stencilling and so on, must be fascinated at the simple and straightforward manner in which the subject is handled. It seems to prove that almost anyone with a little care can become as simple an artist as those whose efforts are illustrated in the book. The need for a second edition is sufficient proof of its value.

(Published, price 10/6, by B. T. Batsford, Ltd., 15, North Audley Street, London, W.1.)

The Jolly Book for Boys

Edited by Edwin Chisholm.

ANY younger reader looking for a book of tales cannot do better than select this. It is a large book, with clear print, excellent pictures in black and white and colour and above all, a rattling selection of first class tales. There are those of interest, of adventure, of amusing situations, all guaranteed to maintain your interest to the end. In consequence you can select just whichever type of story you feel in the mood for and settle down to a long fascinating read. There are stories of spies and the North West Frontier the foreign stretches of the Hudson, of treasure trove to be found in native Africa, not to

mention school adventures to isolated islands and in the school grounds.

There are nearly 200 large pages—the book measures 8ins. by 10ins.—which provide sound and exhilarating reading material for a good many hours.

(Published at 3/6 by Thos. Nelson & Sons, Ltd., Edinburgh).

Relativity and Robinson

By C.W.W.

MOST of us are naturally of an enquiring turn of mind and find it interesting to know the why and wherefore of everything we can. Only by thus learning can we hope to become really educated in the broad outlook of life and the world in general.

How few of us, however, really know the scientific explanation of Relativity. How few, you might ask, need to? But the proposition is so part of our very existence that it will not do to plead ignorance on it. At least not when we have a book such as this to elucidate it so simply!

The dictionary explains that it is a theory that the determination of motion can never be absolute, since all experiments are subject to an indeterminate factor of uniform velocity. But that is a little too deep for everyday mortals and we much prefer the simple, conversational method of proving as undertaken by Robinson the Padre and the Professor.

The various chapters are written as a dream conversation between the three characters in the most natural manner, with simple everyday drawings to illustrate what

could be an obtuse mathematical problem. As the author truly says the matters touched upon "enable us to look . . . on a few of the problems to which the theory of relativity offers so elegant a key."

(Published at 3/6 by The Technical Press, Ltd., 5, Ave Maria Lane, Ludgate Hill, E.C.4.)

Diaries

THERE is no need nowadays for the reader to have a plain diary of dates and days because a variety of special ones are published for his benefit which are sure to appeal to the particular hobby in which he is interested.

Model Engineer

Are you, for instance, interested in model engineering, model aeroplanes, or model sailing ships? If so, you really must have the Model Engineering Diary published by Thos. De La Rue & Co., and obtainable at all the usual stores and shops. It contains an enormous number of useful tables and provides a number of helpful pictures.

If, on the other hand, you prefer one, there are occupational diaries specially suitable for aviators, stamp collectors, gardeners, electrical engineers, etc. A full list is obtainable free on request.

Schoolboys

What about a diary for Schoolboys? Here you have space for sports results, prep. addresses, etc. as well as tables on verbs, maths., chemistry, etc. The price is only 1/- in cloth, or a better one in leather, with a pencil for 1/6. It is surprising what help

you can have at school and at home by the insertion of a few judicious notes in your diary now and again. Total number of lines—marks for prep.—sports records, etc.—all worth making a note about.

Scout Diary

There are also Scout Diaries from 9d. upwards, and these, too, contain a mine of information particularly helpful to those ardent readers of our monthly Scout Notes.

Amateur Photographer

One of our most popular features here are the photographic articles so the "Amateur Photographer" Diary published by Iliffe & Sons, Ltd. at 1/6 should prove worth having for the new year. With it, the amateur has a mine of information always in his pocket. It contains tables of exposures, developing, printing, projection, etc., as well as much helpful information on everyday subjects, the law of copyright and so on.

Motor Diaries

Do you run a motor bike or a motor car? If so, do you check up your costs, mileage, petrol consumption, distance records, places visited, etc.? It is really quite easy with the "Motor Cycle" or the "Autocar" Diary, for special pages are provided for the purpose. In addition are printed details of Speed and Lap Records, traffic signals, touring, maintenance record, etc. Altogether a money-saving investment because it helps to run the "bus" economically and with a knowledgeable interest. Both these Diaries are also obtainable for 1/6, complete with pencil.

Service for Quarter of a Century!

THIS is a letter recently received from "G.W." who prefers to remain unnamed, but whose praise is both true and acceptable.

"Looking over your Annual Handbook brings much to light that is new in Hobbies, also what to me is very striking—how well that which is old still is new. I am pleased to see in the Handbook that the A.I. Fretwork machine is still listed and well it deserves to be. Quite possibly, today I may be ranked in the list of the 'old boys,' but my A.I. machine has hardly grown old in the sense that I have.

"It works as well today, as the day the carter delivered it to me in its crate 28 years ago and during the whole of that time the only parts that have been renewed are the long and short pitmans.

"Even the wooden arms on the machine I have are the original ones as fitted, and as a tribute to the firm of Hobbies Ltd., I will say that since 1908 I have set the machine on hundreds of occasions to do work that I hardly think the designers ever intended for it. Yet it has survived it all, and barring accidents will, I believe, serve me to the end.

"It is a triumph of sound British workmanship which is the highest tribute I can really think of and lends colour to the remark heading my letter 'how well that which is old still is new.' Would that my other chattels had served me half as well!

"Long may you continue in the service of all amateurs, as the tools, materials and designs you provide, bring real joy to the user."

MISCELLANEOUS ADVERTISEMENTS

The advertisements are inserted at the rate of 2d. per word prepaid. Name and address are counted, but initials or groups, such as E.P.S. or £1/11/6 are accepted as one word. Postal Order and Stamps must accompany the order. They will be inserted in the earliest issue. To sell anything except fretwork goods or those shown in Hobbies Handbook. Orders can be sent either to Hobbies Weekly, Advertisement Dept. 30/32 Ludgate Hill, London, E.C.4, or Dereham, Norfolk.

LONELY? Then write Secy., U.C.C., 16BB. Cambridge Street, London, S.W.1. Genuine. Established 1905.

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INVENTIONS PROTECTED. Booklets gratis.—Reginald W. Barker & Co., Patent Agents, 56 Ludgate Hill, E.C.4.

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WANTED original poems, songs, for immediate consideration. Send poems to Columbian Music Publishers, Ltd., Dept. 280, Toronto, Canada.

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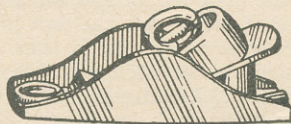
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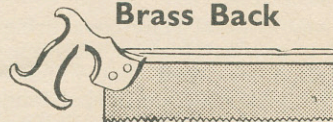
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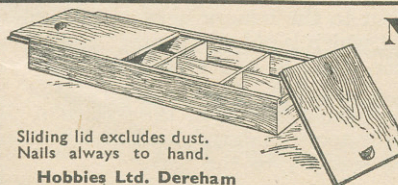
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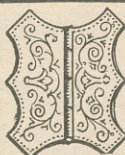


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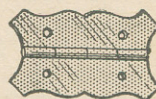
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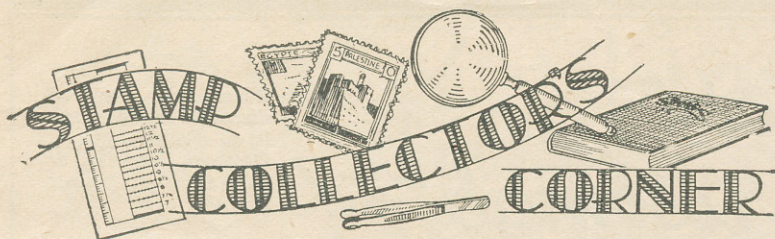
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No. 5379



RANDOM THOUGHTS

THAT'S a quaint title for a stamp page isn't it? Yet how many of you pick up your stamp albums, and just look through them occasionally?

You may not have any actual specimens to mount, yet it is a poor collection which will not enable the owner to pass a pleasant hour just idly turning over the pages and recalling points about the stamps therein.

The writer picked up a volume of his collection the other day and sat down and glanced through, and within a very short time points of interest arose.

For instance, some of the stamps which helped to form the collection were obtained by a relative who was in the merchant service, and each voyage he used to bring a few specimens home. So his contribution would in itself have been very interesting as reminding him of the places to which he had been on a particular voyage. And occasionally when he arrived home he was met with a question concerning the design of a stamp which he had procured. That generally led up to a long chat about some of the places he had visited.

Readers might remember and ask some of the donors of the specimens they receive to describe places, etc. This should certainly be done, as not only will it introduce a chat generally well worth hearing but it will also show some appreciation of the kindness in remembering that you collect.

One specimen which the aforesaid relative brought home was illustrated in *Hobbies Weekly* in the article which followed the death of King George V.—the 2½d. Union of South Africa. This stamp, at the time he bought it, was quite common, yet when presented to me at the end of the voyage it was supposed to be exceedingly good because unscrupulous pedlars had taken a supply of these on board the ship and sold them at 1/- each to those who had to stay on board.

Of course they told the unsuspecting ones that the stamp would be very valuable—well had these unlucky ones only taken the trouble to ask one of their

pals who was going ashore to go to the post office and buy a stamp they would have got the same thing for 2½d. as it was the current issue.

There is a lot of that done unfortunately, because although the hobby is so popular, yet really there are very few who know anything about the value of stamps.

Here is a further example of the lack of knowledge of the value of stamps. The writer was enabled to do a small kindness to someone who had relatives abroad, so this person wrote out to their relatives to ask them to send a few stamps home. The donor, wishing to make the gift a little better, asked them to send the coronation stamps of the Crown Colony unused.



The pair of stamps referred to

Yet had they asked for these stamps to be put on the envelope and postmarked, then the gift would have been more valuable still, because the Coronation stamps from this Colony are more valuable used than unused. Curious perhaps, yet such is the case.

There reposes in that album two very ordinary ½d. and 1d. Australian stamps of the 1913 kangaroo and map set. From the philatelic point of view these stamps should have been removed from the collection long ago because their condition, although unused, is far from 'mint.' But they were sent as a gift just before the donor went to Gallipoli, never to return; those stamps will remain where they are, despite their condition.

Whilst the pair of stamps illustrated did not come out of

the same album, as those previously mentioned, yet they seemed sufficiently interesting to be worth mentioning here.

It is the fault of leaving native labour to put together English lettering and figures—the reason that this took place was that in 1875 a fresh supply of the 5 para stamps was wanted, and the job was left to the native workers.

Now the stamp is, as it were, made up of three different parts, the centre, showing the sphinx and the pyramids, with native wording above and English characters below, that is one part. The word 'para' with the figures 5 to go on the right was the second part, and the native inscriptions and figures 5 to go on the left was the third part. Unfortunately the printers got very badly muddled, and as the lower part of the illustration shows they transposed the right and the left panels so that the figures 5 are upside down with the word para reading upwards on the left instead of downwards on the right.

But that was not all. One would have thought that they had done enough damage for one issue, but no, they contrived very successfully to do some more. This time they arranged it so that some of the stamps were printed upside down and if you look at the upper stamp in the illustration you will see that it is upside down, or at least the centre part is with the two side panels the correct way.

This is what is termed a 'Tête-bêche' pair—rather an interesting point to come across isn't it. The term 'tête-bêche' is a French one applied to stamps printed upside down in relation to one another.

Where a pair of stamps only is in question such a term is necessary, but where there are a number of stamps printed upside down on a sheet it is sufficient to say this, rather than that there are so many 'tête-bêche' stamps.

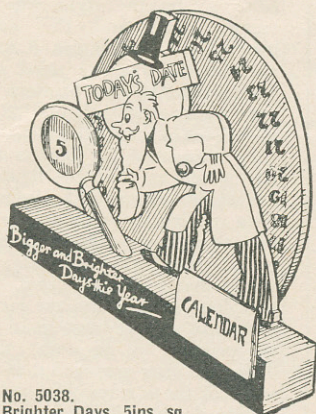
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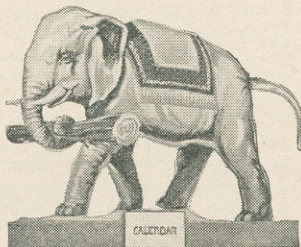


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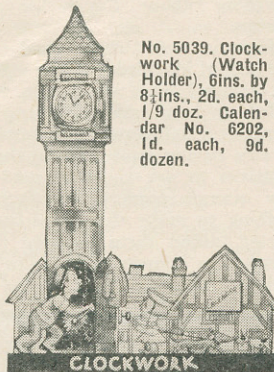
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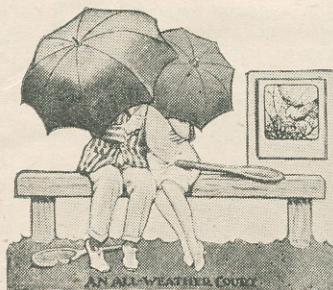
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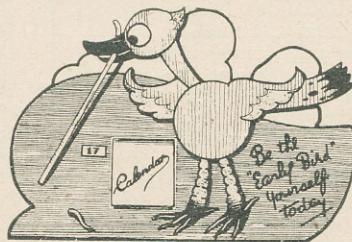
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DESIGN SHEETS.

The presentation Design Sheet is given only with current copies of Hobbies Weekly, and not with back numbers. The designs, however, can be obtained separately, from Hobbies Ltd., price 4½d., post free, or 10d. in the case of double size sheets.

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All orders and letters respecting advertisements should be addressed either to the Advertisement Manager, Hobbies Weekly, Dereham Norfolk, or to 30/32, Ludgate Hill, London, E.C.4.

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Back copies are obtainable from the Editorial address given above or from the Publisher, price 2d. a copy, plus postage.

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The Editor is always pleased to consider suitable articles for these pages, which, if accepted, will be paid for at the usual rates. While every effort will be made to return unsuitable contributions (if stamps for that purpose are sent with them), the Editor does not accept any responsibility for their loss.

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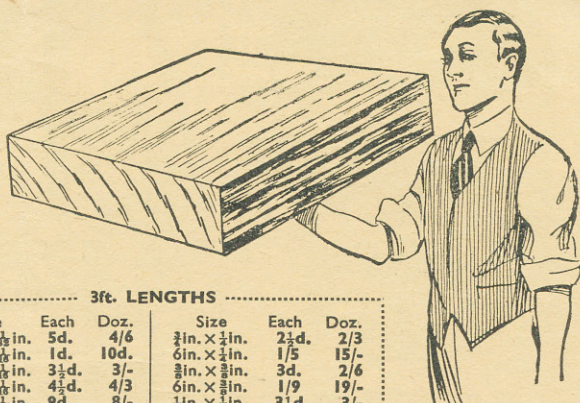
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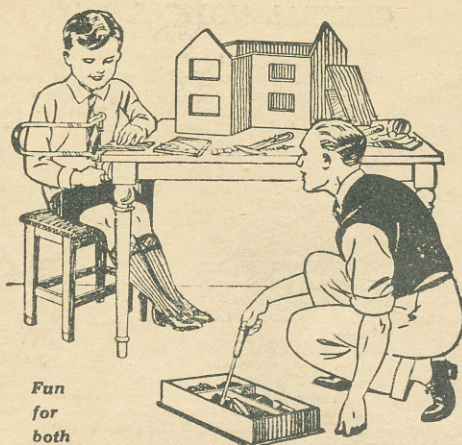
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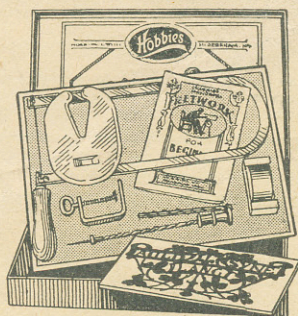


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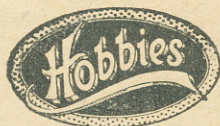
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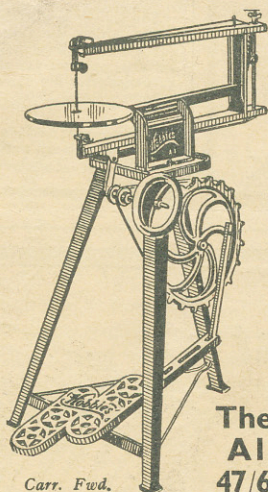


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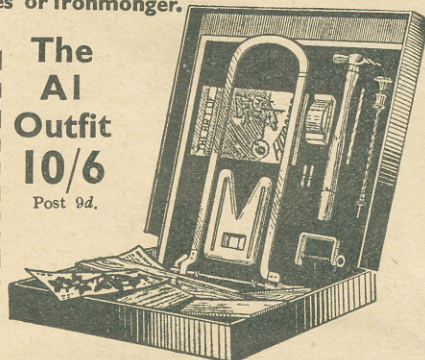
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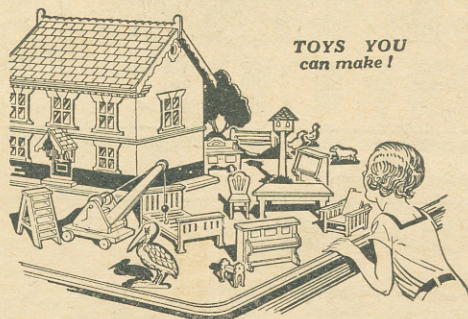
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